

# Analyzing the Effect of Web-based Instruction Applications to School Culture within Technology Integration

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## Abstract

Determining the reflections of technology integration applications that are to be performed in our schools is important to light the way of first steps of integration. In this research, the effect of a web-based instruction environment used by 31 different teachers in a high school to school culture is set forth. The school culture is analyzed within the frame of thoughts and relations of teachers and directors and the spread of these applications that are new for the school. Case study methodology has been applied in this study; the qualitative and quantitative data have been assessed together. The qualitative data of the study include the interviews with teachers, in-class observations, interviews with school directors; the quantitative data are obtained from the surveys applied on teachers. In addition to this, the records obtained from web-based instruction environment have been also used for interpreting other data. At the end of the study, positive changes have been detected over the thoughts and relations of teachers and directors. Moreover, during this research, even though there have been some exceptions, spread of web based instruction activities among teachers has taken place in parallel with the general technology diffusion theory. As a result, we may say that thanks to this research, a culture based on the changes on the teachers and directors and school, usage of technology has started to be formed. Within this direction, the directors, teachers who are the important elements of school culture for technology integration have made suggestions for the applications to be applied in school.

## Key Words

Web Based Instruction, School Culture, Technology Integration.

Recently, integration of technology to education environments has been shown as one of the important reform studies in education (Black & McClintock, 1996; ISTE, 2006; Jonassen, Peck, & Wilson, 1999; Lim & Chai, 2004; Lim & Khine, 2006; Usluel, Mumcu-Kuşkaya, & Demirarslan, 2007; Wu, Hsu, & Hwang, 2008). Within this direction, the school directors and teachers have important roles in technology integration in schools (Earle,

2002; Hew & Brush, 2007; Hsu & Sharma, 2006; Schoepp, 2005; Toprakci, 2006). It may be thought that if these roles are performed by school directors and teachers efficiently, there may be some changes also on school culture. In this research, the roles of school directors and teachers in technology integration have been handled within the frame of "Diffusion of Innovation" theory of Rogers (2003). This process is a multidimensional and difficult process which has many different dynamics such as teacher, director, student, technology (Aviram, 2000; Ertmer, 2006). The reasons of these difficulties have been showed to be lack of time of teachers by Al-Alwani (2005) and Jones (2004). Many researchers have suggested producing materials to meet the needs of teachers and encourage them to use these materials in order to remove these difficulties. In spite of many difficulties, there are also efforts that have positive results in technology integration (Becker, 2001; Ertmer; Jones; Karagiorgi &

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Charalambous, 2004; Lim & Hang, 2003; Schoepp, 2005; Van Den Berg, Vandenberghe, & Slegers, 1999). One of these is the environment where teachers could design their online activities that were designed by Inbal, Dayan and Kali (2009); this research has showed that the change in technology usage is satisfactory. In order to get positive results in technology integration, some researchers have reassessed the vision of teachers and directors and suggested to arrange long term consultancy for teachers including pedagogical and technological approaches (Davis & Varma, 2008; Fishman, Marx, Blumenfeld, Krajcik, & Soloway, 2004). Besides many different applications, web based instruction applications also play an important role in technology integration studies in schools (Barker, 2002; Hannafin, Kim & Kim, 2004; Leamnson, 2001; Lee & Tsai, 2006). Many researchers working in this field have stated that web technologies could enhance learning and contribute to technology integration in schools (Jain & Getis, 2003; McCannon & Crews, 2000; Nam & Smith-Jackson, 2007; Neo, 2003; Wallace, 2004; Windschitl, 1998; Woo & Reeves, 2007). Within this scope, environments where together with web based instruction activities, students could construct the information themselves should be assessed as a big potential (Fishman et al.; Lee ve Tsai). In spite of this potential, the directors and teachers defined as technology leaders by Janson and Janson (2009) haven't still stated how the usage and spread roles of web based instruction applications in school should be (Friedman, 2006; Pyle & Dziuban, 2001; Wallace; Zhao, Pugh, Sheldon, & Byers, 2002). The behaviors and accustoms of directors and teachers inside the school are the elements shaping school culture (Akbiyik, 2010; Fishman et al.; Roschelle, Pea, Hoadley, Gordin, & Means, 2000). Thus, for the definition of school culture, Johnston (1987) focuses on the rules, believes and values that are shaped in time with the behaviors and relations of teacher and students; Deal and Peterson (1999) focus on value and belief patterns; Poore (2005) focus on the approaches, thoughts of teachers and directors to teaching and learning. Additionally, it is also stated here that the belief, values and cultural features stated here could also affect the usage of new technologies (Barron, Kemker, Harnes, & Kalaydjian, 2003; Bush, 2007; Ediger, 1997).

For this reason, the spread of web technologies which has an important role in technology integration between teachers and directors in schools may cause some changes on the school culture that is shaped with long term accumu-

lation. Starting from this thought, the effect of applying web based instruction application of different courses have been tried to be analyzed within the spread inside the school. Within this direction, the problem of research is stated as: "How the web-based applications performed inside the school affects the school culture?" Within this scope:

The effect over school culture has been analyzed within the directions of:

How did the perspectives of teachers and directors change with the new technology?

What was the change on communication between the teachers and directors with the new technology?

How was the new technology used and diffused in the school?

## Method

## Research Design

The research was a case study; it was performed by taking both qualitative and quantitative research techniques into consideration. The research especially focused on the spread of new technologies within the frame of technology integration inside the school. The data were collected from 31 teachers and 3 directors by using three different data collection tool as interview, observation, and survey.

## Process

First of all, a learning environment where teachers could load and share the course materials, exchange messages was prepared. Later, it was presented to the usage of teachers for a six months period in a high school. During this period, the school managers supported the healthy performance of research; encouraged the teachers to use the system. The used course materials included the animation, video, picture, text, e-book, and presentations that could be operated in web environment.

## Instrument

The qualitative data were obtained from the interviews with teachers, in-class observations, and interviews with school directors; the quantitative data were obtained from the surveys (n=31) applied on teachers. During the research,

it was thought that by determining the changes in the thoughts of directors, it was possible to get clues for the changes experienced in school culture. Because, it is emphasized by many researchers that directors have an important impact over the change of school culture (Stolp & Smith, 1994; Thacker & McInerney, 1992). Thus, in these researches, teachers told students could take important responsibilities for the physical structure of courses and school culture. Within this scope, the interviews conducted with the directors were semi-structured and they were applied at the start and at end of the research. The teachers were generally interviewed between course intervals, in teacher's room, canteen, and school garden. For the surveys, the surveys prepared for technology integration by Barron et al. (2003) was used. After the necessary language requirement studies, it was applied on 40 teachers in pilot application and the reliability coefficient was found 0,79.

### Data Analysis

The survey applied on teachers was prepared in Likert form and the answers were assessed over the averages and standard deviations of each item. The data collected from the interviews were presented with the assessment of "critical incident" (Baki, 1994; Bliss & Ogborn, 1997) method. After analyzing the records for the analysis of interviews with the directors, the codes were determined according to concepts detected from the answers of directors (Yıldırım & Şimşek, 2000). After that, the themes that can explain these codes in a general level were applied.

### Results

The findings obtained from directors, teachers and system records were presented within the direction of research problems. During the work, the directors stated that generally there was a positive development over the thoughts of teachers for the new technologies and this research performed at the school was a start for the usage of new technologies. Also, it was understood from the statements of some directors that; some teachers developed positive ideas for using internet in the scope of education. Besides, the ideas of directors for using internet in the scope of education also developed in a positive way. At the end of the research, when the findings obtained from surveys applied to

teachers, observations and system records were also analyzed together, it was seen that the more informed the teacher were about the system, the more interested they were to use the system. In some cases, the teachers stating negative ideas were tried to be convinced by a leader teacher selected by other teachers. At this point, the seminar performed during application enabled to develop positive ideas. The findings obtained from system records showed that the number of materials loaded to the system by teachers increased day by day and the number of member students on this system continued to increase. As the weeks passed by, the teachers loaded more and more materials to the system and with the increase of new student and teacher members in the system, the interest and usage of web-based materials increased as well. So, it is possible to say that the internet usage for instruction culture that is started to be formed in schools has started to be spread among teachers.

### Discussion

It is claimed in many researches that the more teacher use the technology in education, the more they see the benefits concretely, the more change will occur on their believes and ideas about using it on education (Ajjan & Hartshorne, 2008; Baki, 2000; Çakıroğlu, Güven, & Akkan, 2008; Gibbone, Rukavina, & Silverman, 2010; Levine, 2006; Ngai, Poon, & Chan, 2007). At this point, the change of ideas and believes of teachers in the school may play role in forming a new culture (Wu et al., 2008). It is stated by (Hennessy, Ruthven, & Brindley, 2005; Shiue, 2007) that technology integration will have an important role in forming this culture. It is seen that during this integration process, as stated in Technology Acceptance Model of Davis (1989), "usefulness" and "easy of use" elements also have a big impact over teachers' willingness to use technology. Thus, Usuel and Demiraslan (2005) think usefulness perception as the belief to increase one's own performance by using something new. On the other hand, since some teachers used the systems no matter how low their number is, it could be said that beside many factors teachers' openness for change and innovation is also very important (Aslan, Özer, & Bakır, 2009). Therefore, Park and Ertmer, (2008) puts teachers' negative ideas as one of the most important obstacles in the way of technology integration. It is also concluded in this re-



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